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High-Temperature Oxidation and Erosion-Resistant Refractory Coatings

Various refractory coating systems have been evaluated for rocket nozzle application by actual rocket test firings. A coating system consists of the refractory coating bonded to a particular substrate. The results of these tests may be of interest not only for applications in the severe environment imposed by the rocket firings, but also for other applications where high melting temperature, thermal stability, oxidation resistance and/or erosion resistance are required.

Results of the firing tests for 18 such coating systems are presented in the reference noted below. Failure mechanisms are identified, and promising concepts for future developments are derived from the tests. Several of the coatings exhibited desirable characteristics which could broaden their applicability.

Among the coatings showing promising results were iridium, iridium-rhenium, and hafnium oxide-zirconium oxide. The iridium metal was particularly successful in resisting oxidation. The bonding of the coatings to various substrates by the gas-pressure-bonding technique was shown to be promising.

Notes:

1. The results of these tests may be of interest in tooling design for high pressure molding, for nu-

clear reactor liners, and for general applications requiring a high degree of oxidation resistance.

2. The following documentation is available from:
Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference:

NASA-TN-D-4964 (N69-33481), Development
of Improved Throat Inserts for Ablative
Rocket Engines

3. Technical questions may be directed to:
Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
Reference: TSP70-10634

Patent status:

No patent action is contemplated by NASA.

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